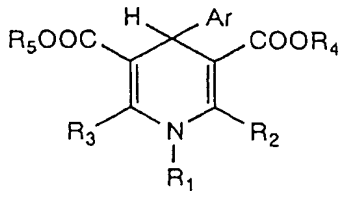
WHAT IS CLAIMED IS:

1. A process for producing a three-dimensional polyimide optical waveguide, which comprises:

(I) irradiating a polyamic acid film with a laser beam while converging the laser beam at an inside portion of the film and relatively moving the light convergence point, the polyamic acid film containing:

(a) a polyamic acid obtained from a tetracarboxylic dianhydride and a diamine; and

(b) per 100 parts of the polyamic acid, from 0.5 part by weight to less than 10 parts by weight of a 1,4-dihydropyridine derivative represented by formula (I):



(I)

wherein Ar represents an aromatic group having a nitro group at an ortho-position with respect to the bonding position to the 1,4-dihydropyridine ring; R_1 represents a hydrogen atom or an alkyl group having 1 to 3 carbon atoms; and R_2, R_3, R_4 and R_5 each independently represents a hydrogen atom or an alkyl group having 1 or 2 carbon atoms, and then,

(II) heating the polyamic acid film to imidize the polyamic acid, thereby obtaining an optical waveguide having a continuous core region where the refraction index has been changed, in the thus formed polyimide film.

2. The process according to claim 1, wherein the tetracarboxylic dianhydride contains a fluorine atom.

3. The process according to claim 1, wherein the diamine contains a fluorine atom.

4. The process according to claim 1, wherein the 1,4-dihydropyridine derivative represented by formula (I) is selected from the group consisting of 1-ethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine, 1-methyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine, 1-propyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine and 1-propyl-3,5-diethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine.

5. The process according to claim 4, wherein the 1,4-dihydropyridine derivative represented by formula (I) comprises 1-ethyl-3,5-dimethoxycarbonyl-4-(2-nitrophenyl)-1,4-dihydropyridine.

6. The process according to claim 1, wherein the laser beam is a pulse laser having a pulse width of 10^{-15} to 10^{-12} second.

7. The process according to claim 6, wherein the pulse width is 10×10^{-15} to 500×10^{-15} second.

8. The process according to claim 7, wherein the pulse width is about 50×10^{-15} to about 300×10^{-15} second.

9. The process according to claim 6, wherein the pulse laser has a repeating frequency of from 1 Hz to 80 MHz.

10. The process according to claim 9, wherein the repeating frequency is from 10 Hz to 500 kHz.

11. The process according to claim 6, wherein the irradiation of the pulse laser is carried out at an irradiation energy of from 1 to 500 mW.

12. The process according to claim 11, wherein the irradiation energy of the pulse laser is from 10 to 100 mW.